

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-45

Name: Durkee Lake

County: Meade

Legal description: Sec. 21 & 28, Twn. 12 N, R 17 E

Location from nearest town: 3 miles south of Faith, SD

Dates of present survey: June 14, 25-27, 2012

Date last surveyed: June 13, 20-22, 2011

Management classification: Warmwater permanent

Primary Species: (game and forage)

1. Largemouth Bass
2. Yellow Perch
3. Bluegill
4. Black Crappie

Secondary and other species:

1. Northern Pike
2. Channel Catfish
3. Black Bullhead
4. Golden Shiner

PHYSICAL CHARACTERISTICS

Surface Area: 70 acres;

Watershed: 6,400 acres

Maximum depth: 20 feet;

Mean depth: 15 feet

Lake elevation at survey (from known benchmark): Two feet below full-pool.

Ownership of lake and adjacent lakeshore property:

The City of Faith owns Durkee Lake and the SD Department of Game, Fish and Parks manages the fishery in the lake. Hunting is illegal in or around Durkee Lake by city ordinance. A city-administered golf course is located adjacent to the lake.

Fishing Access

Fishing access is reasonable with a few shore fishing areas along the north side, but by June is very limited with heavy vegetation surrounding the entire lake. A boat ramp and dock are located on the north side. The concrete on the boat ramp is breaking up and uneven and in need of repair.

Observations of Water Quality and Aquatic Vegetation

Rooted aquatic vegetation consists of bulrushes and cattails. The vegetation covers approximately 90% of the shoreline. Submerged vegetation is excessive from mid summer until freeze up in all water under 8 feet. Siltation due to natural erosion and cattle grazing has decreased depth and area of the lake. No other pollution problems were identified during the 2012 survey.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads, etc)

The dam grade was repaired in 1997, and is in good condition. The boat ramp is breaking up in places, and although still useable, is in need of some repair.

MANAGEMENT OBJECTIVES

- Objective 1.** Maintain a Largemouth Bass fishery with a minimum night-time electrofishing CPUE for stock-length fish of 40, a PSD range between 40 and 70, PSD-P \geq 10.
- Objective 2.** Reach and maintain panfish (Bluegill, Black Crappie and Yellow Perch) trap-net CPUE greater than 10 and less than 75 for each species. Maintain PSD's greater than 30 for at least two of the panfish species.
- Objective 3.** Maintain a mean trap net CPUE of stock-length Black Bullhead <100 and PSD between 30 and 60.

BIOLOGICAL DATA

A lake survey was conducted at Durkee Lake on June 25-27, 2012. Sampling consisted of two experimental gill (gill) net (45.7 m [150 ft] long and 1.8 m [6 ft] deep with six 7.6 m [25 ft] panels of bar mesh sizes: 12.7 mm [0.5 in], 19.1 mm [0.75 in], mm [1.25 in], 38.1 mm [1.5 in], and 50.8 mm [2.0 in]) nights and eight modified fyke (trap) (1.3 X 1.5 m frame, 19.1 mm [0.75 in] mesh and a 1.2 X 23 m [3.9 X 75.5 ft] lead) net nights (Figure 1; Tables 1 and 2). One trap net was tampered with and not counted in the sample. Nighttime boat electrofishing was conducted at Durkee Lake on June 14, 2012. Six sites were completed during the survey for a total of 60 minutes of electrofishing (Table 3). Discussion on selected fish species follows and completes this report.

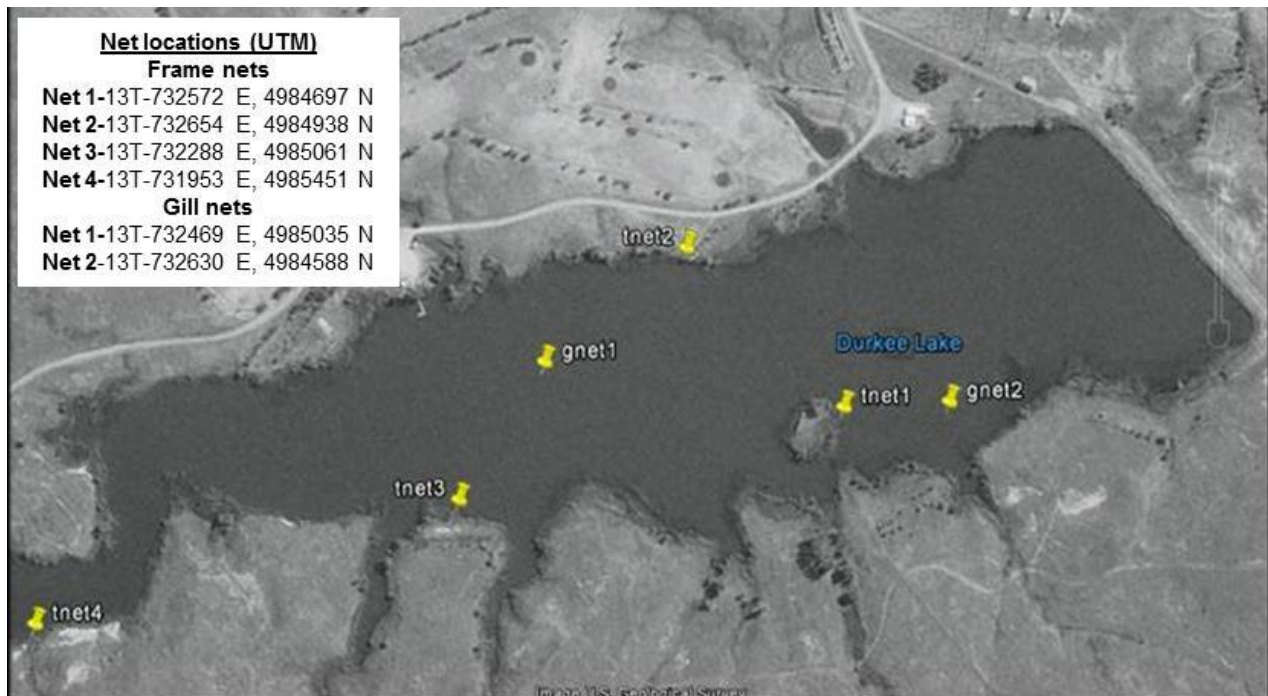


Figure 1. Locations of experimental gill (gnet) and modified fyke (tnet) nets, including GPS coordinates, during the fisheries survey of Durkee Lake, Meade County, South Dakota, 2012.

Table 1. Species, number captured (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD) and proportional stock density of preferred size fish (PSD-P) and relative weight of stock length and greater fish ($Wr \geq S$) captured in modified fyke nets in Durkee Lake, Meade County, South Dakota, June 25-27, 2012. CPUE values with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Black bullhead	1,644	234.9 (60.0)	234.9 (60.0)	4 (1)	2 (1)	81.3 (2.4)
Black crappie	31	4.4 (1.7)	4.4 (1.7)	6 (--)	0	98.5 (1.5)
Bluegill	1,562	223.1 (49.3)	223.1 (49.3)	5 (1)	0	101.7 (1.9)
Largemouth bass	4	0.6 (0.4)	0.6 (0.4)	--	--	114.8 (8.4)
Northern pike	14	2.0 (0.3)	2.0 (0.3)	100	29 (23)	88.7 (4.6)
Yellow perch	25	3.6 (2.9)	3.6 (2.9)	12 (11)	12 (11)	96.4 (1.8)
Total	3280					

Table 2. Species, number captured (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD), proportional stock density of preferred size fish (PSD-P) and relative weight of stock length and greater fish ($Wr \geq S$) captured in two experimental gill nets in Durkee Lake, Meade County, June 25-27, 2012. CPUE values with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Black bullhead	115	57.5 (16.9)	57.0 (18.5)	1 (1)	1 (1)	87.9 (3.1)
Black crappie	4	2.0 (--)	1.5 (1.5)	--	--	91.9 (21.9)
Northern pike	6	3.0 (3.1)	3.0 (3.1)	100	0	92.0 (3.4)
Yellow perch	27	13.5 (20.0)	9.0 (9.2)	0	0	95.9 (1.5)
Total	152					

Table 3. Species, number captured (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD), proportional stock density of preferred-length fish (PSD-P) and relative weight of stock length and greater fish ($Wr \geq S$) captured during night electrofishing in Durkee Lake, Meade County, South Dakota, 2012. CPUE values with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Largemouth bass	58	58.0 (12.5)	54.0 (11.9)	65 (11)	15 (8)	112.8 (1.0)

Bluegill

Following a winterkill in 2007, efforts were made to reestablish Bluegill by stocking 50 adult and 22,000 fingerlings during the summer of 2008. Catch rates continued to climb in 2012, with a mean catch per unit effort (CPUE) of 223.1, compared to 96.9 in 2011 and 12.3 in 2010. Size structure was low with a proportional stock density (PSD) of 5 (Table 1). Fish condition was good with a mean relative weight for stock length and longer fish ($Wr \geq S$) of 101.7. Length frequency histograms indicates a large year class just under 150 mm (6 in), similar to 2011 (Figure 2).

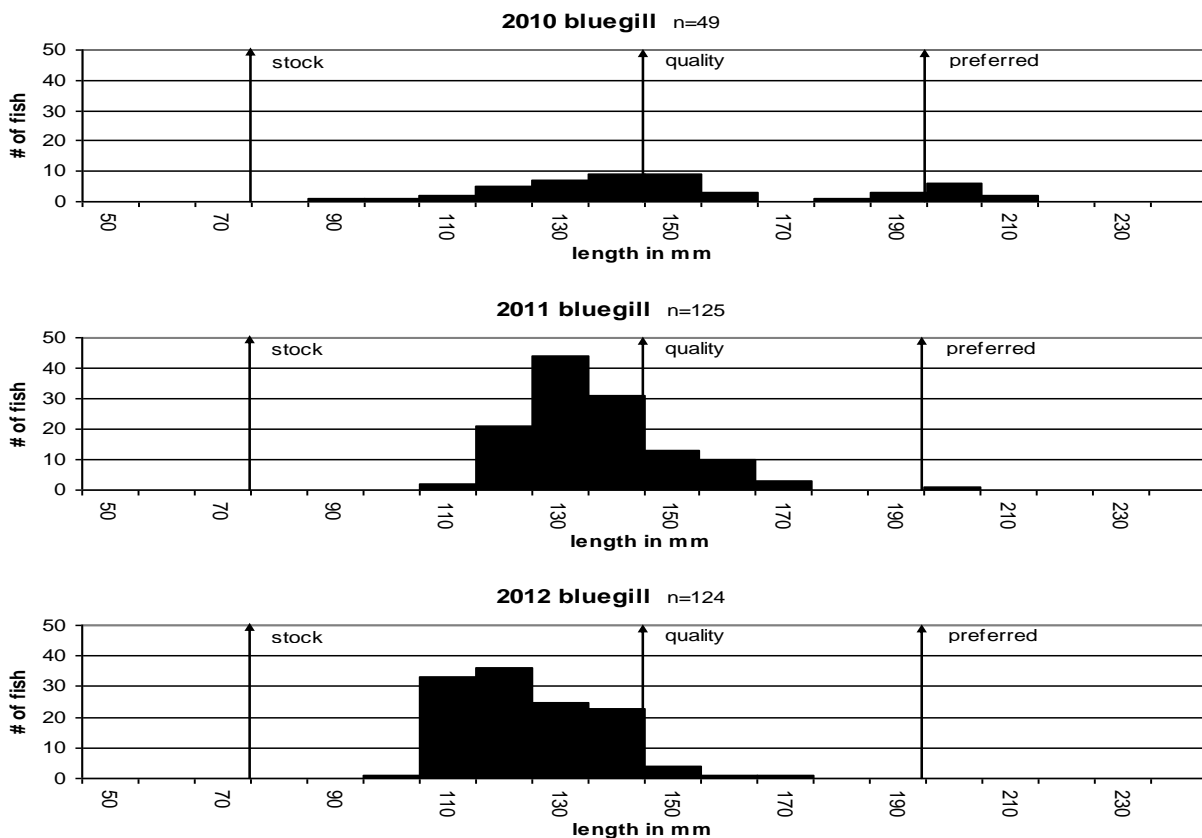


Figure 2. Length frequency histogram of Bluegill collected in Durkee Lake, Meade County, South Dakota, 2010-2012.

Black Bullhead

Black Bullhead were the most abundant fish sampled during the 2012 survey, as they were in 2011. In 2010, Black Bullhead numbers were abundant with a mean trap net CPUE of 739.8 and a gill net CPUE of 42. Last year, trap net CPUE was down to 164.0, and gill net catch was 44.5 per net. This year numbers increased to CPUE of 234.9 per trap net and 57.5 per gill net (Tables 1 and 2). Size structure is characteristic of high density, competing population with a small size structure (i.e. PSD of 4 with a PSD-P of 2). Fish condition was low, with a mean $Wr \geq S$ of 81.3. A large year class dominates the population with total lengths ranging from 170-190 mm (Figure 3).

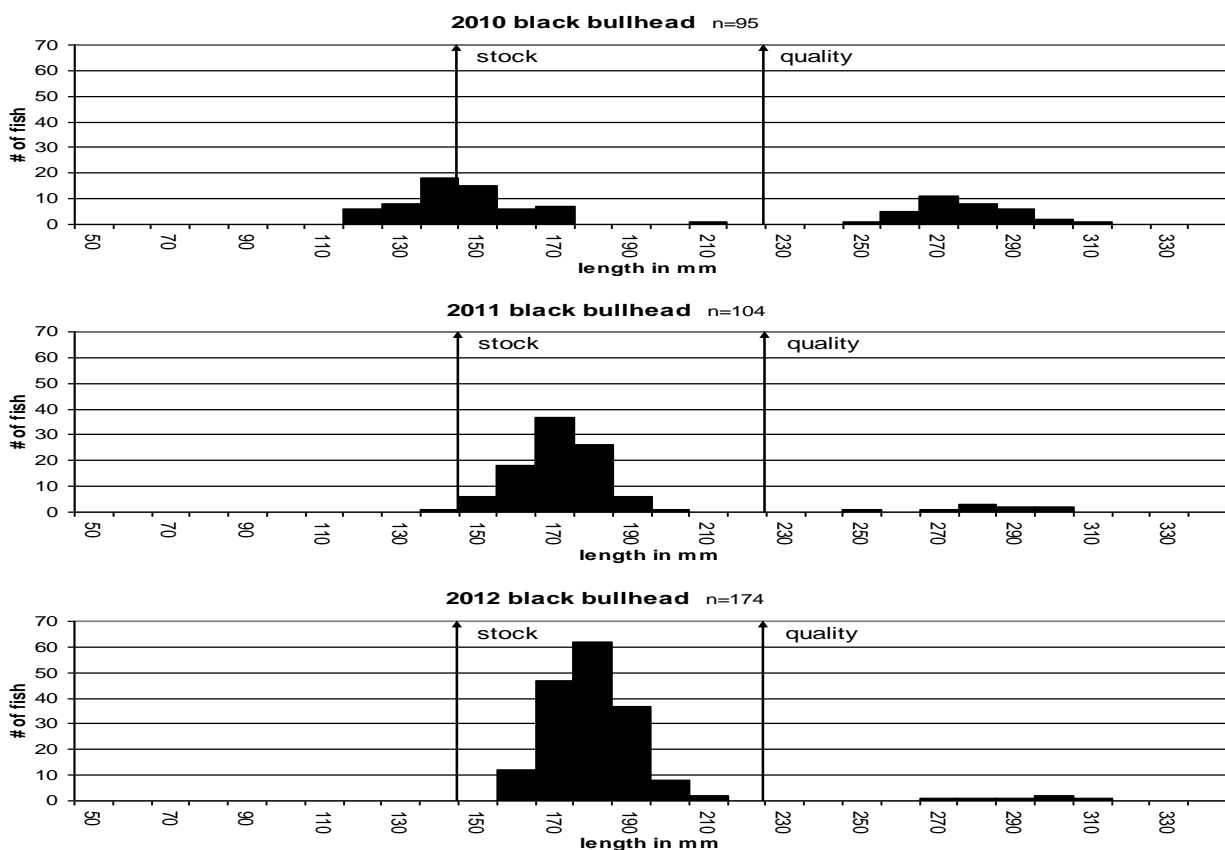


Figure 3. Length frequency histogram of Black Bullhead collected in Durkee Lake, Meade County, South Dakota, 2010-2012.

Black Crappie

After the winterkill in 2007, no Black Crappies were sampled in the 2008 survey. As a result, In 2009, 150 adults were stocked in an effort to reestablish the population in 2009. In 2010, a single individual was sampled in the trap nets. Last year, 21 individuals were sampled in the trap nets and six were sampled in the gill nets. This survey, trap net CPUE was 4.4 with a PSD of 6. It appears the stocking was successful as at least two year classes can be observed in the length frequency histogram Black Crappies (Figure 4).

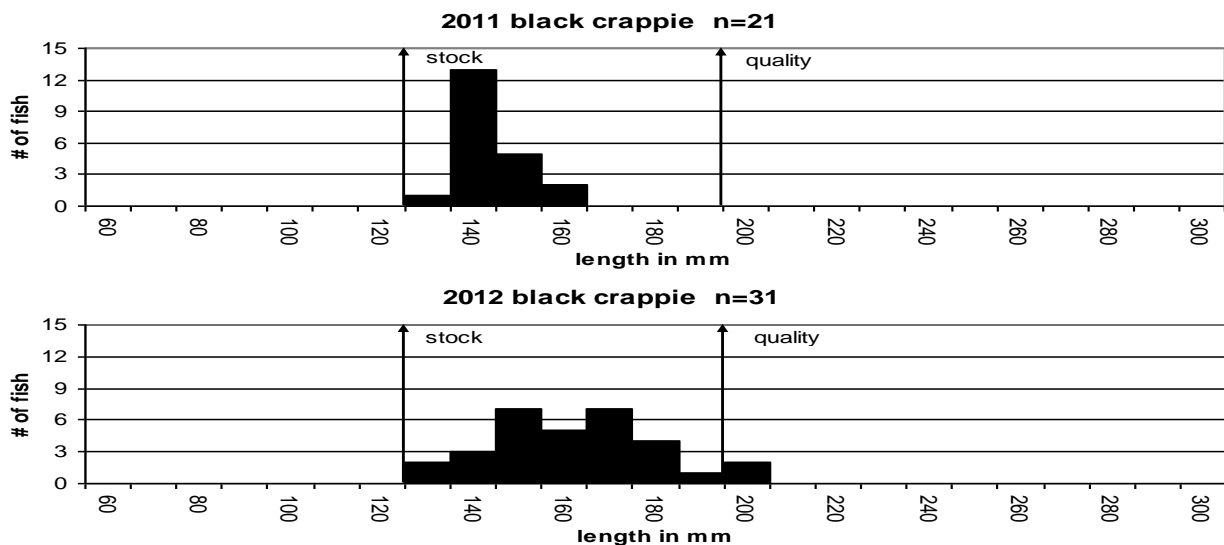


Figure 4. Length frequency histogram of Black Crappie collected in Durkee Lake, Meade County, South Dakota, 2011-2012.

Largemouth Bass

During late summer and early fall of 2008, 200 adults and 10,000 fingerlings were stocked. The fall 2008 electrofishing survey indicated that a remnant population still existed, with ten adult Largemouth Bass collected in 60 minutes of electrofishing. To supplement the low density population, an additional 1,150 juveniles were stocked in 2009. The 2009 fall electrofishing yielded a stock length and larger CPUE of 51.3 with a PSD of 12 and a PSD-P of 1. In 2011, CPUE was 30.0 with stock indices of 73 and 40, respectively. This year catch rates and sizes were up with a CPUE of 58.0, and a PSD of 65 and a PSD-P of 15 (Table 3). Length frequencies show a balanced population with sizes ranging from 170- 460 mm (Figure 5). Size structure and density are meeting management objective ranges, but whether Largemouth Bass can influence Bluegill and Black Bullhead populations is still undetermined.

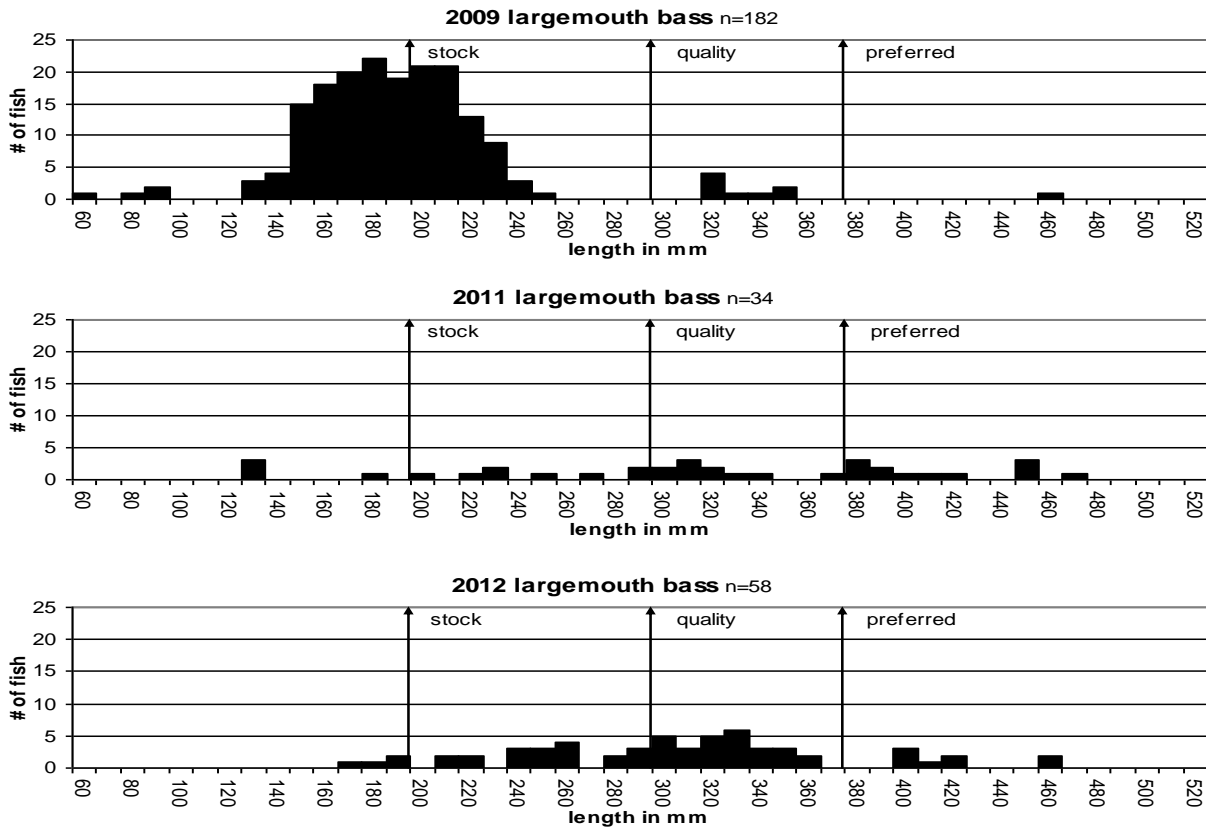


Figure 5. Length frequency histogram of Largemouth Bass collected by nighttime boat electrofishing in Durkee Lake, Meade County, South Dakota, 2009-2012.

Northern Pike

The Northern Pike population appears to be stable with a trap net CPUE of 2.0 and a gill net CPUE of 3.0 (Tables 1 and 2). In 2011, trap net CPUE was 0.5 and gill net CPUE of 4.0. The six Northern Pike sampled in the gill nets this year yielded an average $Wr \geq S$ of 92.0, which is good for a small impoundment in western South Dakota. The length frequency histogram indicates that all fish sample were greater than quality length, indicating a lack of recruitment in recent years, potentially due to lower water levels (Figure 6).

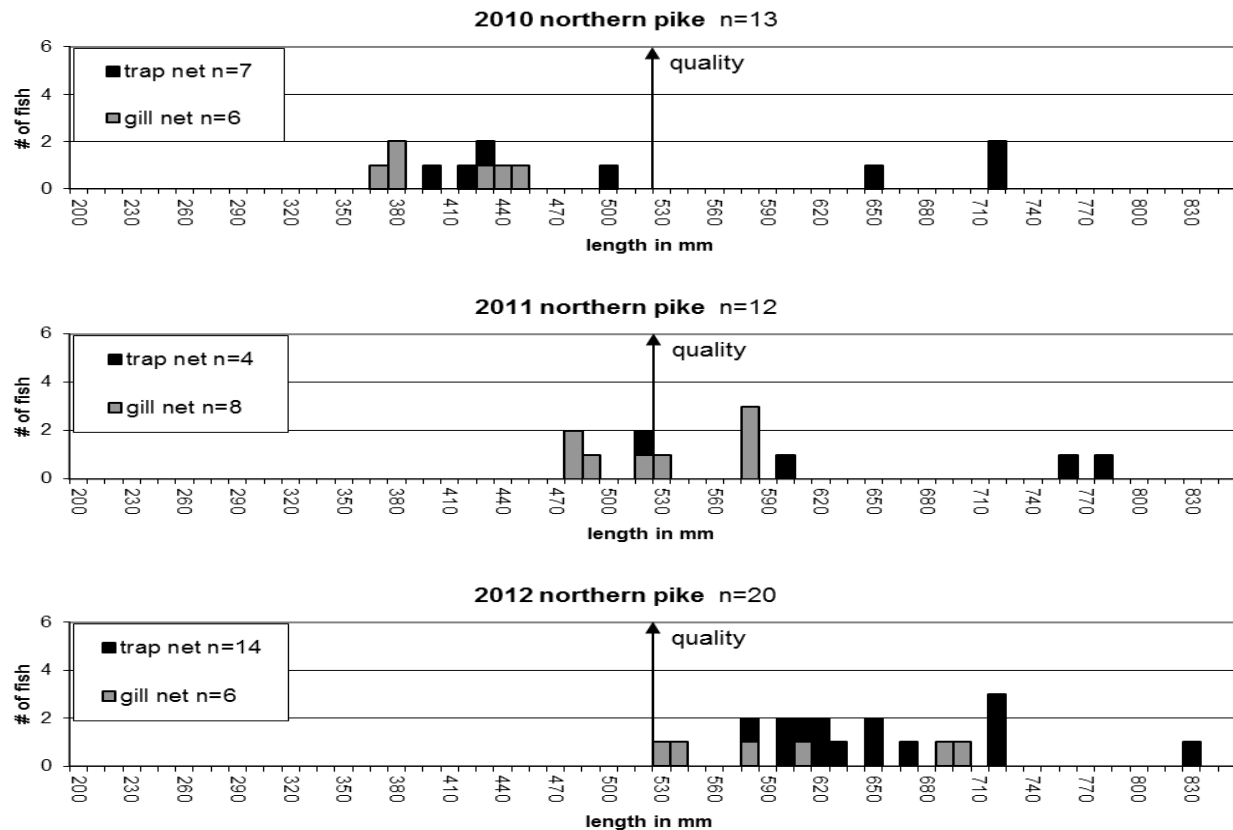


Figure 6. Length frequency histogram of Northern Pike collected by modified fyke (trap) and experimental gill nets in Durkee Lake, Meade County, South Dakota, 2010-2012.

Yellow Perch

The Yellow Perch population remained similar to 2011. Gill net CPUE was 13.5 and trap net CPUE was 3.6 this year (Tables 1 and 2), compared to a gill net CPUE of 5.0 and trap net CPUE of 3.5 in 2011. Fish condition was good with a W_r for stock length and longer fish of 95.9. Length frequency histograms indicate a low density population with several small year classes presents (Figure 7). Stable water conditions should improve the Yellow Perch population.

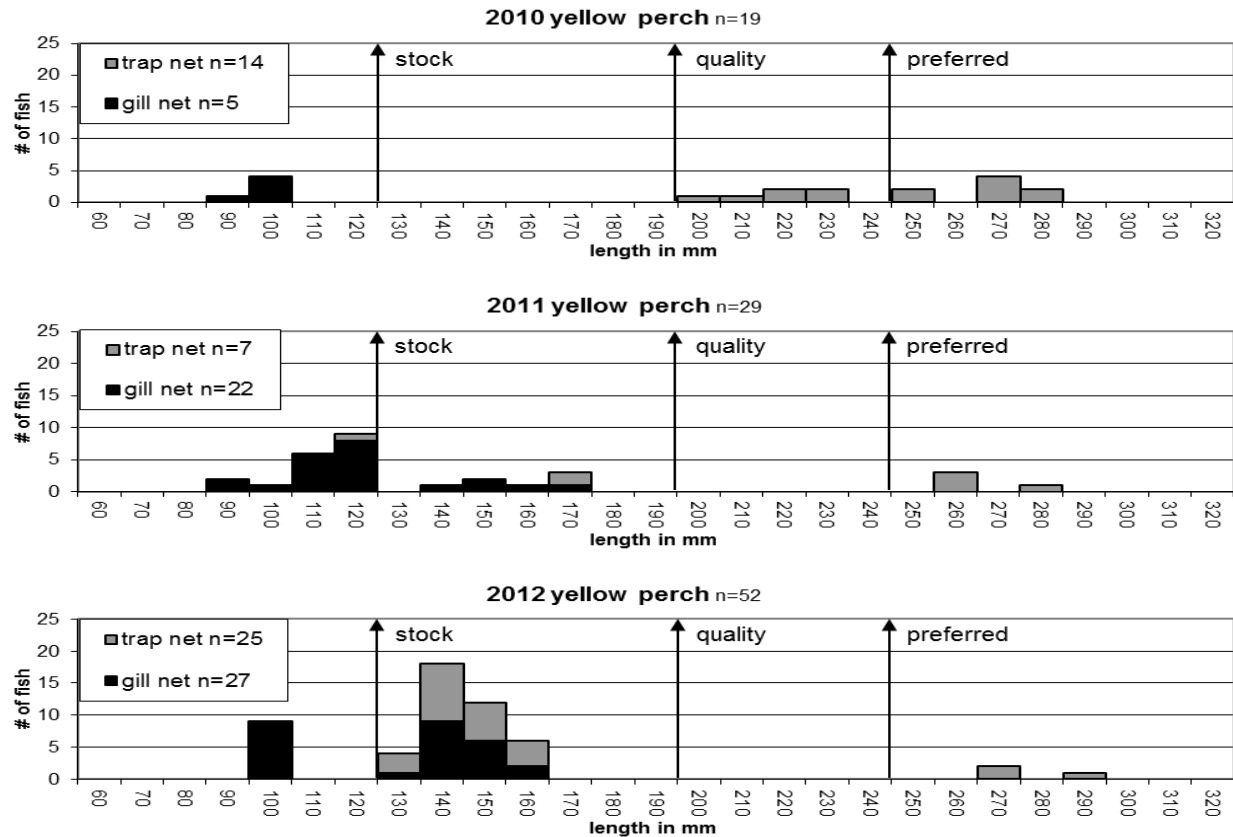


Figure 7. Length frequency histogram of Yellow Perch collected in experimental gill and modified fyke (trap) nets in Durkee Lake, Meade County, South Dakota, 2010-2012.

RECOMMENDATIONS

1. Continue conducting night electrofishing surveys annually to monitor the Largemouth Bass population in Durkee Lake.
2. Re-evaluate Yellow Perch, Bluegill and Black Bullhead populations in 2013 with a netting survey. Attempt removal efforts of Black Bullheads to attempt to reduce density. Use the Bluegill population as a source of adult fish for transferring to other waters.

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish stocked into Durkee Lake, Meade County, South Dakota, 2000-2012.

Year	Number	Species	Size
2000	500	Black Crappie	Adult
	8500	Largemouth Bass	Fingerling
2002	7700	Largemouth Bass	Fingerling
	589	Largemouth Bass	Adult
	100	Smallmouth Bass	Adult
2008	192,500	Northern Pike	Fry
	50	Bluegill	Adult
	22,000	Bluegill	Fingerling
	200	Largemouth Bass	Adult
	10,000	Largemouth Bass	Fingerling
2009	1,155	Largemouth Bass	Juvenile
	150	Black Crappie	Adult
2011	400	Yellow Perch	Adult